

CLAIMS

What is claimed is:

1. A packaged semiconductor device comprising:
  - 5 a first semiconductor die disposed over a package substrate, said first semiconductor die coupled to said package substrate;  
a plurality of wire bonds coupled said first semiconductor die and coupled to said package substrate for electrically coupling said first semiconductor die to said package substrate;
  - 10 a first layer of encapsulant disposed over said first semiconductor die and disposed over said plurality of wire bonds; and  
a second semiconductor die disposed over said first layer of encapsulant and coupled to said first layer of encapsulant, said second semiconductor die electrically coupled to said package substrate.
- 15 2. The packaged semiconductor device of Claim 1 wherein said second semiconductor die is directly coupled to said first layer of encapsulant using adhesive.
- 20 3. The packaged semiconductor device of Claim 2 wherein said second semiconductor die at least partially overlies said first semiconductor die.
4. The packaged semiconductor device of Claim 2 wherein only portions of said first layer of encapsulant and said adhesive extend between said first

semiconductor die and said second semiconductor die, and above an internal region of the top surface of said first semiconductor die, said internal region including that portion of the top surface of said first semiconductor die that lies inside of any bonding pads that are disposed within said top surface of said  
5 first semiconductor die.

5. The packaged semiconductor device of Claim 2 wherein no spacer is disposed between said first semiconductor die and said second semiconductor die.

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6. The packaged semiconductor device of Claim 2 wherein said package substrate is a ball grid array package substrate.

7. The packaged semiconductor device of Claim 6 wherein said plurality  
15 of wire bonds comprise a first set of wire bonds, said packaged semiconductor device further comprising:

a second set of wire bonds coupled to said second semiconductor die and coupled to said ball grid array package substrate for electrically coupling said second semiconductor die to said ball grid array package substrate; and  
20 a second layer of encapsulant disposed over said second semiconductor die and disposed over said second set of wire bonds.

8. The packaged semiconductor device of Claim 1 wherein said adhesive comprises a silver-filled epoxy adhesive.

9. A method for forming a packaged semiconductor device comprising:  
coupling a first semiconductor die to a package substrate;  
coupling a plurality of wire bonds to said first semiconductor die and to  
said package substrate so as to electrically couple said first semiconductor  
5 die to said package substrate;  
disposing encapsulant over said first semiconductor die and over said  
plurality of wire bonds;  
at least partially curing said encapsulant;  
coupling a second semiconductor die to said encapsulant, said second  
10 semiconductor die at least partially overlying said first semiconductor die; and  
electrically coupling said second semiconductor die to said package  
substrate.
10. A method for forming a packaged semiconductor device as recited in  
15 Claim 9 wherein said coupling a second semiconductor die to said  
encapsulant comprises attaching said second semiconductor die to said  
encapsulant using adhesive.
11. A method for forming a packaged semiconductor device as recited in  
20 Claim 10 wherein said package substrate comprises a ball grid array package  
substrate.
12. A method for forming a packaged semiconductor device as recited in  
Claim 11 wherein only said encapsulant and said adhesive extend between

said first semiconductor die and said second semiconductor die, and extend above an internal region of the top surface of said first semiconductor die, said internal region including that portion of the top surface of said first semiconductor die that lies inside of any bonding pads that are disposed  
5 within said top surface of said first semiconductor die.

13. A method for forming a packaged semiconductor device as recited in Claim 9 wherein said curing said encapsulant comprises fully curing said encapsulant.

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14. A method for forming a packaged semiconductor device as recited in Claim 9 wherein said encapsulant comprises an epoxy-based polymer encapsulant.

15 15. A method for forming a packaged semiconductor device as recited in Claim 10 wherein said plurality of wire bonds comprise a first set of wire bonds, said electrically coupling said second semiconductor die to said package substrate further comprising attaching a second set of wire bonds to said second semiconductor die and to said package substrate.

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16. A method for forming a packaged semiconductor device as recited in Claim 15 further comprising the step of:  
applying encapsulant such that said encapsulant is disposed over said second semiconductor die and over said second set of wire bonds.

17. A method for forming a packaged semiconductor device comprising:
- coupling a first semiconductor die to a ball grid array package substrate using adhesive;
- 5 coupling a first set of wire bonds to said first semiconductor die and to said ball grid array package substrate such that said first semiconductor die is electrically coupled to said ball grid array substrate;
- forming a first layer of encapsulant that covers said first semiconductor die and said first set of wire bonds;
- 10 coupling a second semiconductor die to said first layer of encapsulant using adhesive, said second semiconductor die at least partially overlying said first semiconductor die;
- coupling a second set of wire bonds to said second semiconductor die and to said ball grid array package substrate such that said second semiconductor die is electrically coupled to said ball grid array package substrate; and
- 15 forming a second layer of encapsulant that covers said second semiconductor die and covers said second set of wire bonds.
- 20 18. A method for forming a packaged semiconductor device as recited in Claim 17 wherein only portions of said first layer of encapsulant and portions of said adhesive extend between said first semiconductor die and said second semiconductor die and above an internal region of the top surface of said first semiconductor die, said internal region including that portion of the top

surface of said first semiconductor die that lies inside of any bonding pads that are disposed within said top surface of said first semiconductor die.

19. A method for forming a packaged semiconductor device as recited in  
5 Claim 18 wherein said forming a first layer of encapsulant comprises disposing encapsulant and at least partially curing said encapsulant.

20. A method for forming a packaged semiconductor device as recited in  
Claim 19 wherein said at least partially curing said encapsulant comprises  
10 fully curing said encapsulant.